

On 5 May 2006, the Central Valley Regional Water Quality Control Board (hereafter Water Board) considered tentative waste discharge requirements (WDRs) for Calpine Geothermal Partners, L.P. et al. Prior to the 5 May 2006 hearing, the Water Board accepted written comments on the tentative WDRs considered at that meeting and provided a written Staff Report containing responses to comments. After the hearing on 5 May 2006, the Water Board directed staff (Staff) to consider revisions to the WDRs in four areas: possible use of steel tanks for containment of acidified geothermal fluid, determination of amount of financial assurance, elimination of underground geothermal fluid transfer piping, and location of groundwater monitoring wells. On 8 August 2006 a Notice of Public Hearing (NOPH) was circulated stating that the Water Board would consider revised tentative WDRs at the 22 September 2006 Water Board meeting and that comments would only be accepted on the revisions made since the 5 May 2006 Water Board meeting. This document contains the responses to written comments submitted to the Water Board on the revised tentative WDRs, and indicates where revisions were made to the revised tentative WDRs. Written comments from interested persons on the revised tentative WDRs were required to be submitted to the Water Board by 8 September 2006 in order to receive full consideration. Comments were received by the due date from the following persons:

- A. Mt. Shasta Bioregional Ecology Center
- B. Pit River Tribe
- C. Stanford Legal Clinic
- D. Save Medicine Lake Coalition
- E. Dr. Robert Curry
- F. Calpine Corporation

MT. SHASTA BIOREGIONAL ECOLOGY CENTER (MSBEC) COMMENTS

MSBEC –COMMENT #1: Page 2, Paragraph 1 - The commenter notes that the prohibition for acidification of Well Nos. 85-33 and 64-27, which are within the North Coast Region, was not specifically identified in the latest version of the tentative WDRs.

RESPONSE

Prohibition A.5 has been removed from the September version of the revised tentative WDRs and has been replaced by Provision D.3. Provision D.3. clarifies that the WDRs limit formation stimulation by acids to Well No.31-17, which is the only well in the KGRA (known geothermal resource area) approved by BLM for formation stimulation. The WDRs themselves do not regulate the operation of the geothermal wells.

MSBEC –COMMENT #2: Page 2, Paragraph 2 - The commenter notes that one of the changes to the May 2006 tentative WDRs, additional monitoring for sump leakage, was not included in the list of items upon which the Central Valley Water Board would consider comments. The commenter, however, did comment on the sump monitoring. See Comment #3 below.

RESPONSE

The tentative WDRs sent out for comment on 8 August 2006 contained some changes that were not specifically identified at the May 2006 Water Board Meeting. These were primarily house keeping issues such as typographical errors and accidental omissions. The inclusion of additional monitoring for sump leakage, was added to strengthen and augment the groundwater monitoring program in response to comments. The Discharger is in agreement with the additional monitoring requirements. The specific comments on the monitoring are addressed below.

MSBEC –COMMENT #3: Page3, Paragraph 1 - The commenter refers to a statement in the 25 March 2003 letter from Water Board staff to Janie Painter in reference to acidified discharge to sump, "If the contents of the sump are found to be 'hazardous' the Discharger will be required to re-inject immediately to a well approved by US Department of the Interior, Bureau of Land Management (BLM) and US Environmental Protection Agency (USEPA). The commenter questions why this language was not included in the latest tentative WDRs.

RESPONSE

The issue of discharges of hazardous waste was addressed in the Staff Report for the May 2006 Water Board meeting. In summary, the disposal of wastes resulting from geothermal activities is exempt from the hazardous waste regulations by both USEPA and the state Department of Toxic Substances Control. Title 22 California Code of Regulations section 25143.1 exempts such wastes that are regulated by the Water Boards. These WDRs contain prohibitions and other conditions to protect waters of the state from wastes associated with the geothermal activities of this project and are likely more protective than if the discharges occurred under the hazardous waste regulations.

These WDRs require that waste discharged to geothermal fluid sumps from acidified wells must be re-injected immediately and that non acidified geothermal discharges must be re-injected within 60 days or in no case later than 1 November in any calendar year. This is in marked contrast to Class II Surface Impoundments at landfills, which may contain hazardous waste continuously for many years. The additional sump leak monitoring strengthens the protection of groundwater.

MSBEC –COMMENT #4: Pages 4 and 5, Paragraphs 1-6 - The commenter states that since Calpine Corporation was unwilling to submit geothermal well logs and other proprietary/confidential information to the commenter's consultant Dr. Robert Curry, Dr. Curry was unable to comment on the adequacy of the monitoring proposal from Calpine's consultant Earth Systems Southwest (ESS). In response to Calpine's position on this issue, Staff submitted the ESS report to Phil Woodward, Senior Engineering Geologist, for comment. Mr. Woodward's memo was not completed and reviewed internally until 14 September 2006. A copy was e-mailed to interested parties including the commenter on 15 September 2006. As the tentative WDRs comment period closed on 8 September 2006 there was no opportunity for comment. The commenter maintains that, as a result, the hearing to consider the tentative WDRs should be postponed to a later meeting.

RESPONSE

The hearing was postponed to a later meeting, in part, to assure thorough responses to comments. The report prepared by Mr. Woodward is directly related to the location of monitoring wells. The tentative WDRs do not contain specific locations for monitoring wells. Provision D.11 states, "After consultation with Water Board staff and interested parties including BLM, USFS, United States Geological Survey (USGS), the Pit River Tribes and the Mt. Shasta Bioregional Ecology Center, the Discharger shall submit for approval a revised report prepared by, or under the supervision of, and signed by a licensed professional Civil Engineer, Certified Engineering Geologist or Registered Geologist to the Executive Officer by **1 June 2007** which presents a rationale for monitoring well placement and specifies the location of the three shallow and one deep monitoring well as required in the "Medicine Lake Basin Comprehensive Hydrology Monitoring Plan" (Attachment E). After the location is approved by the Executive Officer, at least three shallow and one deep monitoring wells shall be installed prior to the performance of well acidification." The commenter and the commenter's consultant Dr. Curry are among the interested parties referenced in Provision D.11 and will have, therefore, adequate opportunity for monitoring well location input. Other interested persons will also have the opportunity to have input on monitoring well location.

MSBEC –COMMENT #5: Pages 5 and 6, Paragraphs 1-6 - The commenter states that the basis for the calculation of financial assurance for known or reasonably foreseeable releases stated in the Information Sheet is inadequate in its scope. In support of this contention the commenter notes that leakage of geothermal fluid from pipelines and spillage of acidification chemicals during well acidification are not included in the items required to be considered for financial assurance. In addition the commenter notes that the Discharger has not

submitted an estimate of the dollar amount of the financial assurance as requested by Staff.

RESPONSE

The basis for the determination of the amount of financial assurance for mitigation of known or reasonably foreseeable releases is stated in the Information Sheet of the tentative WDRs and is as follows: "The amount of the CD will be based on the sum of costs arising from two 'worst case scenarios' as follows: 1. Calpine is in the process of testing a well and has filled a geothermal fluids sump with geothermal fluid. At this point they abandon the project and a contractor must be hired to come to the site and pump the geothermal fluid in the sump to an injection well. 2. A leak develops in a geothermal fluids sump liner and must be repaired immediately." The commenter states that a large scale spill of acidification chemicals or a geothermal well blow-out would pose far greater environmental threats than the two worst case scenarios above. The commenter's assertion may be correct that a large-scale spill could pose a environmental threat. However, the financial assurance requirements require financial assurances for "reasonably foreseeable" releases. In the opinion of BLM and Water Board Staff, such a scenario does not fall under the definition of reasonably foreseeable releases due to the extensive precautions that have been taken as required by the federal regulations. The federal regulations governing the construction of these type of geothermal wells are very strict as testified by the BLM representative at the 5 May 2006 hearing.

The commenter has also noted the failure of Calpine to submit a written estimate of the financial assurance to the Water Board. The written estimate of the amount of the financial assurance has now been submitted by Calpine and has been sent to the commenter and other interested parties. Water Board members were provided a copy of the estimate.

MSBEC –COMMENT #6: The commenter agrees with Staff's decision to eliminate underground transfer piping from the tentative WDRs and notes that there has been no BLM plan of operation for underground or sub grade piping.

RESPONSE

Comment noted.

MSBEC –COMMENT #7: Page 7 Paragraphs 1 and 2. The commenter questions why no reference was made in the tentative WDRs to the use of steel tanks for containment of acidified geothermal fluid pumped from wells.

RESPONSE

The consideration of steel tanks for containment of acidified geothermal fluid was due to a misunderstanding between Water Board Staff and Calpine staff. When Calpine made the offer to use steel tanks for containment they were

referring to the solid drilling waste. Staff was under the impression that Calpine was referring to geothermal fluid waste. In fact the use of steel tanks for this purpose poses several problems. If the discharge is acidic and contains a high concentration of chloride ions there may be corrosion issues. In addition the volume of tank required, approximately 750,000 gallons, would not be practical to fabricate on site or adequately support.

PIT RIVER TRIBES COMMENTS

Pit River Tribes –COMMENT #1: Pages 1-4 - The commenter contends that the requirements in the NOPH for restricting comments to the areas of financial assurance, the use of steel tanks for containment of acidified geothermal fluids resulting from formation stimulation, placement of monitoring wells and elimination of sub grade piping used to convey geothermal fluid from wells to sumps is unreasonable. In particular, the commenter stresses the need for further environmental review of enhanced geothermal systems (EGS) procedures and the need for the establishment of baseline water quality data. An attachment with a critique of the Comprehensive Hydrology Monitoring Plan, Attachment E, is included. There are no comments specific to the four areas above.

RESPONSE

The record for this matter includes the May 2006 Water Board meeting and associated Water Board files, including comments and response to comments. The Water Board held one hearing already on this matter and continued the hearing to a later Water Board meeting. The Water Board requested information on very specific issues. Therefore, it was appropriate for the notice to limit comments to the specific areas as requested by the Water Board. The commenter did not provide comments specific to the areas subject to additional public comment.

STANFORD LEGAL CLINIC COMMENTS

Stanford Legal Clinic –COMMENT #1: The commenter presents supplemental legal comments on behalf of the Pit River Tribe, the Mount Shasta Bioregional Ecology Center and the Native Coalition for Medicine Lake Highlands Defense. The commenter asserts that further CEQA review is required before acidification may be included in the waste discharge requirements for the exploration/development project at Telephone Flat.

RESPONSE

Further CEQA review is not required by the Water Board prior to adoption of these WDRs.

The Siskiyou County Air Pollution Control District (District) is the CEQA Lead Agency for purposes of the project. In 2003, the District certified an environmental impact report (EIR) and other associated environmental documents. The EIR included several mitigation measures associated with protection of water quality. Concurrently, the federal Bureau of Land Management prepared an Environmental Impact Statement (EIS) under the National Environmental Policy Act. The combined EIR/EIS for the Telephone Flat Geothermal Project addressed “working over” a well to achieve satisfactory commercial potential. (1999 Final EIR at 2.2.3.2.2). Well “workover” is defined in the Schlumberger Glossary of Oilfield Terms as “The process of performing major maintenance or remedial treatments on . . . [a] well.” Remedial treatments would include EGS (enhanced geothermal systems) procedures such as hydraulic fracturing, explosive stimulation thermal fracturing and injection of acids. The Draft EIR was circulated for public comment and public comments were received after a period of 129 days, concluding on 29 September 1998.

Due to litigation on the EIS, there was a period of approximately three years between the time of the final EIR and its intended certification by the District. The District, wanting to ensure that all information was still up to date, prepared an Update Assessment to provide the information needed to determine whether recirculation of the EIR was required prior to certification. It was prepared by contacting the original information sources for the Project EIS/EIR regarding any substantial changes in the project, the regulatory framework and/or the affected environment which may have occurred for each resource topic since distribution of the Final EIS/EIR; evaluating and identifying any potential substantial project-specific or cumulative environmental impacts which could now result which were not disclosed in the Final EIS/EIR; and identifying and disclosing any new or modified mitigation measures or project alternatives which could substantially reduce the severity of an identified environmental impact.

The Update Assessment, as part of the Notice of Intent to Certify the EIR for the project, was noticed for public review on 27 November 2002. Written inquiries pertaining to the public notice could be submitted until 27 December 2002. Thus, the Update Assessment was subject to public comment. The District certified the EIR on 14 February 2003. There were no legal challenges to the EIR following certification.

The Update Assessment found there to be no significant new circumstances or information relevant to environmental concerns and bearing on the Project. There were no substantial changes to the Project, and the Update Assessment determined there to be no new alternatives considerably different from those previously analyzed in the Final EIS/EIR that were technically and financially feasible and could substantially meet the stated purpose and need

for the project that would clearly lessen the significant environmental impacts of the Project. The Update Assessment also identified no new significant environmental impacts that would result from the Project or from any new mitigation measures proposed to be implemented, nor found that a substantial increase in the severity of an environmental impact would now result from the Project. Further, it found no feasible mitigation measures considerably different from others previously analyzed in the Final EIS/EIR which would clearly lessen or reduce the previously identified environmental impacts to a level of insignificance and which were declined to be adopted by the project sponsor. Based on this substantial evidence, the District concluded that recirculation of the EIR was not required.

The Water Board is a responsible agency for purposes of CEQA. As a responsible agency, the Water Board has limited authority with respect to the project. CEQA requires that a responsible agency consider the environmental documents prepared by the lead agency and reach its own conclusions on whether and how to approve the project. A responsible agency has responsibility for mitigating or avoiding only the direct or indirect environmental effects of those parts of the project that it decides to approve. In this case, the Water Board is regulating the disposal of wastes generated as a result of geothermal exploration and development, but is not directly authorizing or regulating the construction or operation of geothermal wells, including acidification. The federal government has the authority pursuant to the federal underground injection control program to authorize and regulate the construction and operation of geothermal wells on federal lands. The proposed WDRs include mitigation measures and monitoring related to the discharges of waste subject to the WDRs and includes requirements for detection monitoring of the geothermal wells that are subject to acid formulation.

As a responsible agency, the Regional Board is required to presume that the CEQA document is valid for its purposes unless the CEQA document is finally adjudged in a legal proceeding not to comply with CEQA or a subsequent EIR is made necessary by Section 15162 of the CEQA guidelines. In this case, there is no pending litigation, as no one challenged the EIR after its certification by the District, and, therefore, the Regional Board must presume that the EIR is valid. Section 15162 of the CEQA guidelines states that no subsequent CEQA document shall be prepared unless the lead agency determines that there are substantial changes in the project or substantial new information involving new significant environmental effects not previously considered. That is not the case here. The Regional Board is revising WDRs to regulate the disposal of waste to land; the Regional Board is not regulating the injection into geothermal wells or the approval or construction of a power

plant. Federal agencies and the District have the authority for such approvals. There is no new information or substantial changes in the project subject to the Regional Board's approval. Therefore, the Water Board is not required to prepare a subsequent CEQA document and it would not be appropriate in this circumstance. The commenter appears to be attempting to require the Water Board to take over as lead agency for the project, but the same commenter had the opportunity to participate in the CEQA process before the lead agency and did not challenge the CEQA document.

In the process of developing the WDRs, the Water Board has considered the CEQA and NEPA documents prepared for this project and has determined that the CEQA and NEPA documents are suitable for purposes of its use as set forth in 14 California Code of Regulations (CCR) section 15231 and that no subsequent EIR is required pursuant to 14 CCR section 15162. The CEQA and NEPA documents evaluated the potential impacts to waters of the state, including potential impacts of "working over" a well, e.g., acidification, and the Water Board has included mitigation and monitoring to address identified impacts, including requiring monitoring for purposes of detecting unauthorized releases from the geothermal wells.

SAVE MEDICINE LAKE COALITION (SMLC) COMMENTS

SMLC –COMMENT #1: Pages 2 and 3 - The commenter states that the basis for the financial assurance is totally inadequate and expresses many of the same concerns as the Mount Shasta Bioregional Ecology Center in A.5 above. She states that one of the "worst case scenarios" should be the uncontrolled and/or unpredicted fracturing and short circuiting of geothermal fluid caused by EGS. She cites opinions on the possible negative effects of EGS expressed by experts in the field at an open meeting on enhanced geothermal systems held in September 2002. She also notes the possibility of microseismicity.

RESPONSE

See response to Comment #5 from MSBEC above.

SMLC –COMMENT #2: Page 3 Paragraph 3 - The commenter states that the use of steel tanks for containment of acidified geothermal fluid has some potential for improvement over sumps in prevention of groundwater contamination but that environmental review should be conducted before it is implemented.

RESPONSE

See response to Comment #7 from MSBEC above.

SMLC –COMMENT #3: Page 3 Paragraph 4 - The commenter expresses approval of the inclusion of the Mt Shasta Bioregional Ecology Center and the Pit River tribe in the monitoring well location decision process and requests that the Save Medicine Lake Coalition be included.

RESPONSE

Staff have no objection in principal to the inclusion of the Save Medicine Lake Coalition in the list of interested parties whose input will be considered in the discussion of monitoring well location. It should be noted, however, that the Mt. Shasta Bioregional Ecology Center and the Pit River Tribe are represented in this matter by Dr. Robert Curry.

SMLC –COMMENT #4: Pages 3 and 4 - The commenter agrees with the elimination of sub grade piping for transfer of geothermal fluid but expresses concerns with the leakage of fluid from the type of aboveground piping previously used for transfer at the site.

RESPONSE

No response required.

DR.ROBERT CURRY COMMENTS

Dr. Robert Curry –COMMENT #1: Dr. Curry presented a written draft of his proposed presentation to the Central Valley Water Board at the 22 September 2006 meeting.

RESPONSE

Dr. Curry made no specific reference to the four points raised during the May 2006 meeting and therefore no staff response is required. Dr. Curry commented during the May 2006 proceeding on this matter, including submitting written comments and providing extensive oral comments at the May hearing. In response to Dr. Curry's, and others, comments, the revised tentative WDRs require detection monitoring of geothermal wells to detect unauthorized releases from such wells. The location of the wells will be determined by the Executive Officer after consideration of comments by interested parties and Staff.

CALPINE CORPORATION COMMENTS

Calpine Corporation –COMMENT #1: The commenter proposed changes to Finding No. 8 and Discharge Prohibition A.5. that would revise the language requiring additional CEQA and NEPA review prior to geothermal well acidification and remove the mandatory requirement for revision of the WDRs subsequent to the issuance of sundry notices by BLM for acidification of wells additional to No. 31-17. The language stating that additional monitoring wells might be required would be retained.

RESPONSE

In response to this comment, to clarify the WDRs, and to be consistent with the action of the Water Board as proposed in the WDRs, Prohibition A.5. has been removed and replaced by Provision D.3. It is more appropriate to address the scope of the WDRs in a provision rather than a prohibition since the Water Board is not directly regulating the construction or operation of the geothermal wells, but rather is regulating the discharge, transfer, and storage of wastes associated with the operation of geothermal wells and is requiring detection monitoring to assure that such operation does not impact waters of the state. The Bureau of Land Management and U.S. EPA regulate such operation under the federal underground injection control program. At least one federal court has addressed the issue of the state's regulation of underground injection and has agreed that the state has some authority to regulate, but it is limited. See *Bath Petroleum Storage, Inc. v. Sovas*, (N.D. New York), 309 F.Supp.2d 357 (2004) (States "retain authority respecting underground injection so long as it does not impinge on the UIC program administered by the EPA." See *Int'l Paper Co. v. Ouellette*, 479 U.S. 481, 492, 107 S.Ct. 805, 93 L.Ed.2d 883 (1987).